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# An Entrepreneurial Initiative for Distributing Energy Efficient Products in Low Income Communities

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# An Entrepreneurial Initiative for Distributing Energy Efficient Products in Low Income Communities



*An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor Science.*

Almost half the households in South Africa are regarded as energy poor, spending more than 10% of their income on energy. We developed an entrepreneurial initiative to help community members support themselves by selling energy efficient products in low income areas, expanding access to safe and energy efficient products while increasing livelihood opportunities. Our team collaborated with the City of Cape Town Office of Sustainable Livelihoods and product distributors to evaluate current distribution methods and possible locations. Together, we concluded that crèches, or preschools, are promising locations to start distribution businesses in low income communities as they reach the target market, are established businesses within the community, and have crèche leaders who already lead entrepreneurial efforts. We developed a Business Model around crèches as the distribution location and provided business start-up resources in an Entrepreneurial Support Packet. We started pilot programs using the efficient Wonderbag cooking product at two crèches, one in a middle income neighborhood and one in a low income township, to evaluate and refine our Entrepreneurial Initiative so it can be replicated at other crèches. Additionally, we interviewed community members in the informal settlements of Langrug and Flamingo Crescent to assess energy practices and needs. Based on this information, we developed savings-payment plans that are suitable for low income communities and created a product catalog. The crèche leaders have an opportunity to expand their distribution business and improve the livelihoods of their community by bringing products needed to address health and safety risks.

*This is an executive summary of a WPI Cape Town Project Centre project that is fully reported at <http://wp.wpi.edu/capetown/projects/p2014/energy/>*

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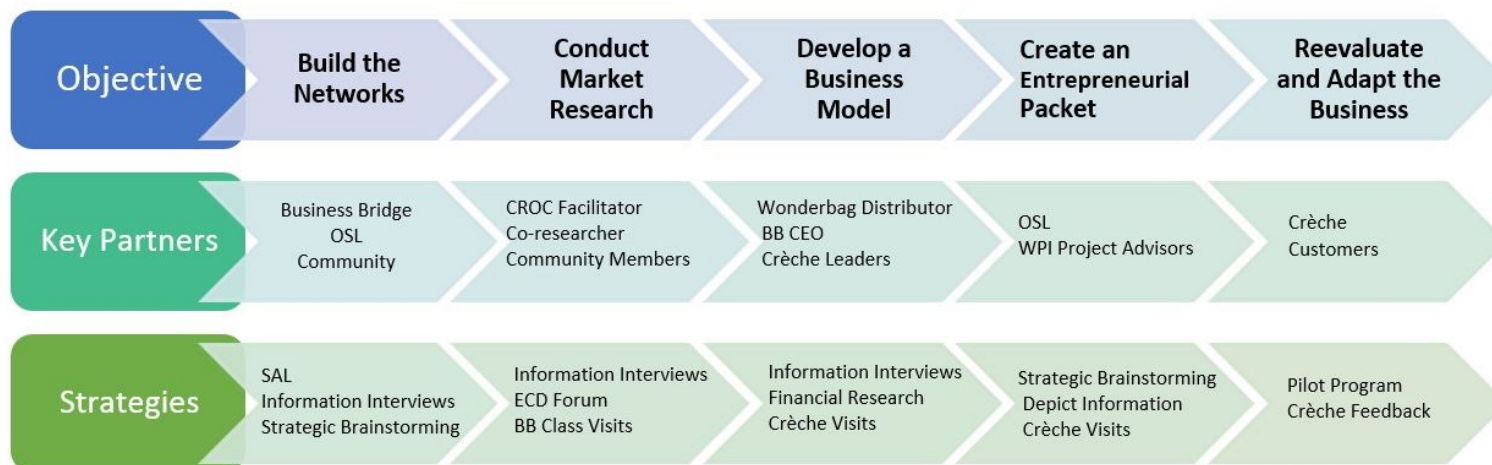
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## Partners

City of Cape Town Office of  
Sustainable Livelihoods  
Gege's Crèche  
Kiddies College Preschool

## BACKGROUND RESEARCH: EVALUATING THE NEED FOR ENERGY EFFICIENT PRODUCTS IN LOW INCOME COMMUNITIES

In South Africa, 47% of households spend more than 10% of their income on energy, and therefore, are classified as energy poor ("A Survey of Energy-Related Behaviour and Perceptions in South Africa," 2012). While national programs like Free Basic Electricity and Free Basic Alternative Energy have been developed to subsidize energy costs, electricity prices in the country continue to increase. Through a survey conducted by the Residential Sector of the Department of Energy, 44% of South Africans revealed their desire to reduce electricity consumption because of anticipated future increases in cost ("A Survey of Energy-Related Behaviour and Perceptions in South Africa," 2012). The survey also concluded that low income community members were open to new sources of energy, provided they are cheaper; however, spreading awareness and increasing investments in energy-saving products has been a challenge for many organizations. For groups concerned with distributing energy products, such as the City of Cape Town Office of Sustainable Livelihoods and the social enterprise company EnerGcare, the biggest difficulty has been developing a sustainable way to distribute the products to communities with high energy poverty.



## OPPORTUNITY: ACHIEVING SUSTAINABLE DISTRIBUTION

There have been a number of initiatives aimed at increasing access to affordable energy products that improve livelihoods in low income communities. For example, the Wonderbag Programme, led by the City of Cape Town Environmental Resource Management Department and Electricity Services Department, donated Wonderbags to new Reconstruction and Development Programme homeowners throughout Cape Town. While the program has helped over 350 recipients so far, the distribu-



tion method relies on government financial support and resources for the free handouts of the products. Donations and trainings are beneficial since they provide the community with products; however, once the products are successfully implemented and the outside organizations leave the community, few livelihood opportunities remain for community members. An opportunity exists to create a new strategy that will bring energy products and services to low income communities while also supporting entrepreneurs in these areas.

## MISSION AND OBJECTIVES: DEVELOPING AN ENTREPRE- NEURIAL INITIATIVE

This project focused on developing an entrepreneurial initiative for community members to support themselves by effectively selling energy efficient products that improve livelihoods in low

income areas. Five main objectives of the project were developed to achieve this goal:

1. Connect with co-researchers and community members to build the business network
2. Conduct market research to understand energy practices and needs in low income communities
3. Develop a business model for the prospective entrepreneurial initiative
4. Create an entrepreneurial packet to explain the business model and associated responsibilities
5. Evaluate and adapt the business model and entrepreneurial packet through pilot programs

## METHODOLOGY

During our project, we adopted the Shared Action Learning (SAL) philosophy as our guiding principle. SAL is an approach developed by the Cape Town Project Centre to foster effective en-



gements with partners. The five main components to SAL are: connecting, planning, enacting, observing, and reporting. These steps guided our work with partners and helped us successfully test our Entrepreneurial Initiative.

### **BUILDING NETWORKS**

We held meetings and in-depth interviews to create a collaborative atmosphere with our key partners including the City of Cape Town Office of Sustainable Livelihoods (OSL), Business Bridge, and community members from Langrug, Flamingo Crescent, Langa, and Observatory. We began to form a working relationship with our partners by sharing our project ideas and personal experiences. Hearing their stories helped us understand the project from their point of view and gave us a clearer perspective on the opportunities for the project.

We established a weekly report meeting with our sponsors, OSL, to update them on our latest findings and discuss how to move forward. With our co-



researcher, Maxwell Dingaan from OSL, we initiated more personal interactions including lunches and historical center visits. To the various community members, we demonstrated our willingness to help and provide our findings.

### **RESEARCHING THE MARKET**

The team talked to a variety of groups, spanning different informal settlements and professions, to gain a deep understanding of the energy efficient product market. We conducted four in-depth interviews and roughly a dozen short discussions to get more information regarding energy practices around heating, cooking, and lighting. Interviews provided valuable information about our target customers, 'the poorest of the poor,' and their energy practices and perceptions to help us move onto the next step of developing an entrepreneurial initiative.

### **DEVELOPING THE BUSINESS MODEL**

Our first step in developing a business model was understanding possible finance models for low income communities in South Africa. We began by researching different finance methods used by small businesses in developing countries – microcredit, microfinance, and microconsignment. Once we arrived in Cape Town, we held meetings with the local Wonderbag distributor and potential entrepreneurs to collaboratively determine the best finance model for distributing energy efficient products.

A critical task was to identify the possi-

ble distribution locations to serve the target market. We established criteria for distribution locations: are trusted within the community, have the ability to provide affordable products to customers, can demonstrate the products' abilities, and have an additional source of income, then talked to multiple groups about places that fit all the criteria. We discussed the potential market for Wonderbags and distribution locations with crèche leaders participating in a Business Bridge class that expands their money management. We also participated in an Early Childhood Development forum, where 45 crèche leaders from different communities gathered to discuss crèche developments, to receive feedback on the Wonderbag price and crèches as distribution locations. These interactions gave us confidence to move forward with the crèche as the distribution location and provided us with a list of other possible distribution locations including churches and spaza shops.

Our next step in the process was creating a sustainable supply chain involving distributors and products. To accomplish this, we met with the local Wonderbag distributor again and reached out to In2Brands and Fluoresave Lighting, companies that sell energy efficient products, to explore finance methods and inventory delivery options.

### **CREATING AN ENTREPRENEURIAL SUPPORT PACKET**

In order to explain the Business Model

and responsibilities clearly, the team created the Entrepreneurial Support Packet. We consulted with our advisors and co-researcher to brainstorm methods that effectively convey information to entrepreneurs.

We next determined effective methods of advertising product savings to low



income community members. We relied on our energy market research and product knowledge to calculate energy savings and depict them using simple diagrams rather than graphs.

### **REEVALUATING AND ADAPTING THE ENTREPRENEURIAL INITIATIVE**

We aimed to help entrepreneurs start businesses by implementing Pilot Programs to gain insights that otherwise may be obscured. To find potential entrepreneurs, we visited six crèches that varied in size, number of students, monthly fees, and location. In every visit, we brought a Wonderbag to explain how it works. If anyone had previously cooked with a Wonderbag, we first asked them to explain the benefits. Then, we used our Entrepreneurial Support Packet to further describe the uses

of the Wonderbag, as well as the potential for a distribution business and the entrepreneurial responsibilities.

Two crèches partook in a two week Pilot Program, allowing us to evaluate the Business Model and Entrepreneurial Support Packet and get valuable feedback from the crèche leaders. The effectiveness of the Pilot Program was evaluated based on whether the crèche leader was able to sell Wonderbags and take the next step to call the distributor for more inventory. Due to the project duration, we were unable to analyze the long-term sustainability. Throughout the pilots, the team monitored their progress and gathered information. The feedback helped us modify the Entrepreneurial Initiative for future implementation.

## KEY ASPECTS OF THE BUSINESS MODEL

OSL has a goal of providing safe, energy efficient products to the 'poorest of the poor.' In order to effectively distribute these products to this market, we have developed an Entrepreneurial Initiative that can continue without outside funding and support. At the core of the initiative is a business model that addresses the end client, distribution location, distributor, business start-up resources, and affordability. The following sections describe each aspect of the Business Model, which we feel is appropriate for low income communities throughout South Africa.



### END CLIENT: UNDERSTANDING THE MARKET FOR ENERGY EFFICIENT PRODUCTS

Energy practices in low income communities produce a variety of safety risks, health concerns, and economic strain. One of the biggest problems is shack fires caused by candles, paraffin, and other makeshift energy practices, like gulleys. Shack fires can burn down a household in less than a minute, spreading rapidly through a community (Town, 2014). This happened three years ago in the Flamingo Crescent informal settlement, a community where we held interviews. Health implications also arise from the current energy practices, specifically cooking and heating. When paraffin stoves are used inside the shack, smoke builds up as there is limited ventilation. This indoor air pollution results in respiratory illness as community members in two different informal settlements shared with us. Lastly,

cost is an important factor when it comes to energy. Low income community members continue to use these unsafe energy methods since they are the cheapest. For example, a liter of paraffin costs R13.50 and is only enough to cook a household two meals, but is most commonly used in non-electrified houses. This led us to realize that a market for safer energy efficient products exists in informal settlements. Therefore, our Business Model aims at bringing to this market energy efficient products that can address the issues associated with the current practices.

### DISTRIBUTION LOCATION: SELLING PRODUCTS THROUGH CRÈCHES

Crèches are a promising location to sell Wonderbags and other energy efficient products because they have fee-paying customers, are respected places within the community, can demonstrate the

products' capabilities, and are already established businesses. A crèche attracts parents looking out for the safety and best interest of their kids; therefore, the parents, specifically mothers, are more likely to purchase products that can give their children a better future. Additionally, a crèche is a trusted, central location in the community. Since customers are more willing to buy products from someone they trust, guardians are more likely to buy products from crèche leaders that care for their children. Community members whose children do not attend the school also know where the crèche is located and can purchase products there. The crèches can also use the products, which demonstrates its benefits and capabilities, a key part of making a sale. Finally, the crèche is an established business. In most cases, selling energy efficient products cannot be the entrepreneurs





sole business because of the investments needed and unsteady rate of sales; therefore, incomes from the crèche and distribution business can supplement one another. The crèche leaders have experience running a business making them ideal candidates as energy product entrepreneurs.

#### **DISTRIBUTOR: DELIVERING INVENTORY AND UTILIZING MICROCONSIGNMENT**

The methods of paying for and obtaining inventory are critical considerations for entrepreneurs. Both must be tailored to fit the needs of entrepreneurs in low income communities to prevent economic strain. Since many entrepreneurs in these areas do not have the financial means to front the money to purchase products, providing the inventory on microconsignment is attractive because there is no initial investment as payment is instead made after products are sold. Also, community members do not always have access to transportation, so it is difficult to get the inventory if the products are not delivered. Therefore, the product distributor must be able to bring the products to the crèche to fill the transportation gap. The financing and delivery of inventory is an essential part of making the business model work in low income communities.

#### **BUSINESS START-UP RESOURCES: ENTREPRENEURIAL SUPPORT PACKET**

An Entrepreneurial Support Packet fur-

ther develops the crèche leaders' business skills through a variety of resources that are graphic based to facilitate understanding across literacy levels and language barriers. These provide the support for managing inventory, recording sales, and advertising as detailed later.

#### **AFFORDABILITY: PAYMENT PLANS FOR THE TARGET MARKET**

Energy efficient products can have high initial costs. In order to make them affordable to the end clients and aid the entrepreneurs with their sales, payment plans were created. These allow the customers who did not have the means to pay in full upfront to pay in two smaller payments within two weeks.

### **ENTREPRENEURIAL SUPPORT PACKET**

As part of the Entrepreneurial Initiative, the team created an Entrepreneurial Support Packet to convey the different aspects of the Business Model to emerging entrepreneurs. This packet includes various documents that encompass how the business works and the entrepreneurs' responsibilities:

1. Entrepreneurial Support Packet Overview summarizes the contents of the Entrepreneurial Support Packet and the Pilot Program.
2. Wonderbag Business Guide outlines the supply process and payment plans using pictures.



3. Wonderbag Safety Tip Flyer provides an overview of how to use a Wonderbag properly and safely.
4. Wonderbag Sales Log is a record keeping sheet that assists in monitoring sales.
5. Energy Savings Poster pictorially shows the paybacks of the Wonderbag, so community members see the value of investing in these products.
6. Pilot Program Contract details the expectations and responsibilities of the entrepreneurs and WPI Energy Team.
7. Wonderbag Seed Capital gives five Wonderbags at no cost.
8. Wonderbag Advertisements are flyers to be displayed in the community.
9. Pilot Program Log records reasons someone did or did not purchase a Wonderbag.

Since the contents of the Entrepreneur-

ial Support Packet depicted the complex business concepts with simple graphics and pictures, it was well received by the crèche leaders, as they understood what was being portrayed and required to maintain the business. It proved to be a successful, valuable resource for starting up more distribution businesses in other locations.

An Energy Efficient Product Catalog was created to sustain the distribution business and further the Entrepreneurial Initiative. The catalog has products the crèche leader can choose to sell based on what the community needs and wants. It also provides benefits, price, payback time, and distributor contact information for each product. The crèche leaders have an opportunity to



improve the livelihoods of their communities by bringing products needed to address health and safety risks.

### **PILOT PROGRAM**

The Pilot Program was designed to evaluate the Business Model and the Entrepreneurial Support Packet and gather feedback from crèche leaders to adapt

the Entrepreneurial Initiative for future implementation. We were able to test the initiative at two crèches: Kiddies College Preschool in the middle income neighborhood of Observatory and Gege's Crèche in the low income township of Langa.

Kiddies College Preschool sold the five initial Wonderbags in the first week. They then took the initiative to contact the Wonderbag distributor for more inventory as was described in the Entrepreneurial Support Packet. In the second week, they were able to sell two more Wonderbags and are continuing to grow their business. This was very encouraging as it showed that the Business Model has potential for getting energy efficient products into the community.

Gege's Crèche also had success with selling the Wonderbags despite the concern of whether they were capable of supporting the business in their community. They were able to sell two Wonderbags in the two weeks. Although this is lower than Kiddies College Preschool, the Wonderbags sold to student ratio was roughly the same, about



5%. This suggests that there is a market for Wonderbags in the community of Langa, and the Business Model may effectively reach this market. When Gege's Crèche continues its distribution business in the upcoming school year, it will be seen whether they are able to sell their initial supply and contact the distributor.

Various departments within the City of Cape Town are working together, overseen by OSL with the help of our co-researcher Max, to conduct longer Pilot Programs in 2015. These will determine if the model is effective at crèches of different income levels and evaluate the long-term sustainability of the model. Early signs suggest that the model does support distribution businesses in low income communities and may be a suitable model for expanding to a wider range of communities throughout South Africa.

## RECOMMENDATIONS

We have created a list of recommendations for our sponsors, OSL, and future researchers. Based on the information we have generated through our research, development of the Entrepreneurial Initiative, and the Pilot Program, we recommend that:

1. Longer Pilot Programs be implemented at various crèches throughout Cape Town using the Entrepreneurial Support Packet to evaluate the long-term sustainability of the Business Model and its viability in

## KEY FINDINGS

Selling Energy Efficient Products Cannot be the Entrepreneurs Sole Business and Income

Distribution Location must be able to Provide Trust, Affordability, and Product Confidence

Creches are Effective Distribution Centers with a Regular Market for Energy Efficient Products

Product Inventory must be Provided by a Distributor on Microconsignment and Delivered to the Location

Entrepreneurial Responsibilities Need to be Conveyed in Simple Graphics

High Initial Cost of Energy Efficient Products Reduces their Market

different income communities.

2. We recommend that a catalog of energy efficient products be presented to the crèches to encourage distribution of various products that can improve the livelihoods of low income communities.
3. The concept of the Entrepreneurial Initiative be tested at different distribution locations within low income communities in Cape Town such as churches and community centers.
4. Researchers continue to gather energy cost and usage information and develop visual means of representing the long-term savings associated with investing in energy efficient products to low income consumers.

## CONCLUSION

The Entrepreneurial Initiative we have

developed addresses the need for energy efficient products in low income communities and replaces current unsustainable distribution methods. It encourages crèche leaders to assume an entrepreneurial role and sell energy efficient products they feel best improve the lives of their community members. We have developed a business model and an Entrepreneurial Support Packet using the Wonderbag as an example energy efficient product. The crèche leaders are able to select other energy efficient products from the catalog we compiled to expand their distribution business. This initiative can be replicated in additional crèches and potentially other distribution locations in low income communities. Therefore, our Entrepreneurial Initiative can be an important step in addressing the persistent problems of energy access and livelihood opportunities in South Africa.





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